

ABSTRACT OF THE DISCLOSURE

A method for arithmetic expression optimization includes receiving a first instruction defined for a first processor having a first base, the first instruction including an operator and at least one operand, converting the first instruction to a second instruction optimized for a second processor having a second base when all operands do not carry potential overflow or when the operator is insensitive to overflow, the second base being smaller than the first base, and converting to a wider base a third instruction that is the source of the overflow when the at least one operand the potential for overflow and when the operator is sensitive to overflow. An apparatus for arithmetic expression optimization includes at least one memory having program instructions and at least one processor configured to use the program instructions to receive a first instruction defined for a first processor having a first base, convert the first instruction to a second instruction optimized for a second processor having a second base when every one of the at least one operand does not carry potential overflow or when the operator is insensitive to overflow, the second base being smaller than the first base, and convert to a wider base a third instruction that is the source of the overflow when the at least one operand the potential for overflow and when the operator is sensitive to overflow.